



Additional chart coverage may be found in CATP2, Catalog of Nautical Charts.

SECTOR 3 — CHART INFORMATION

SECTOR 3

KOREA — WEST COAST

Plan.—This sector describes the W coast of Korea, which forms the E side of the Yellow Sea, between Haenam Gak, its SW extremity, and the Yalu River, about 250 miles N. The general descriptive sequence is from S to N.

General Remarks

3.1 Tides—Currents.—In the approach to Inch'on in the area W of a line through Gyeongryeolbi Yeoldo, Tokchok Kundo, and Youp'yong Yolto and E of a line S from Sunwi Do, the tidal currents are rotary, turning clockwise in 12 hours. That is at the time of LW at Inch'on the direction is between S and SE, 3 hours after LW between N and NE, at HW between N and NW, and 3 hours after HW between W and SW. The lowest velocity occurs about the time of HW and LW, and about the maximum velocity about 3 hours after HW and LW.

In Ch'onsu Man the tidal currents run N and S. The N current runs from about 6 hours before HW to the time of HW and Inch'on, and the S current from the time of HW until 6 hours later. Slack water lasts for only about 10 minutes. The maximum velocity of the tidal currents near Tasurigii Amu is from 1.5 to 2 knots, and in the channel between the islets in the entrance the maximum velocity is from 4.5 to 6.25 knots.

Heavy overfalls occur off the SE end of Wonsan Do and on the E side of the fairway. The tidal current near the N end of Hoyja Do are very irregular and may cause the vessel to yaw.

In the passage between Anma Do and Songman Do the tidal currents are weak, but outside the latter and along the SE coast of the former they are strong. Near the W ends of Hoeng Do and Chuck To the tidal currents are somewhat stronger, with a velocity of 2 to 2.75 knots having been experienced.

Caution.—Fishing nets and aquaculture farms are set within 2 miles offshore in numerous places off the coast of Korea. In some places they extend as far as 5 miles offshore.

Extensive mine laying operation took place in Korean waters during the 1950-53 war. [For further details, refer to Pub. 120, Sailing Directions \(Planning Guide\) Pacific Ocean and South-east Asia.](#)

Heugsan Jedo

3.2 Heugsan Jedo, consisting of five groups of islands, lies about 50 miles off the SW part of the Korean peninsula and is separated from it by Maemul Sudo.

These groups extend along the coast for a distance of nearly 50 miles. The coasts of the various islands are more or less indented by bays which afford anchorage for small vessels.

Jitsuko Sho (Himuki Sho)(33°57'N., 124°36'E.), with a depth of 6.7m, lies about 27 miles WSW of Sohuksan Do, the SW group of Heugsan Jedo.

Sohuksan Do (34°04'N., 125°07'E.) consists of precipitous coasts, with its higher parts densely wooded, especially on its N side; the summit of the island is a rounded peak. The SE extremity of the island consists of high cliffs rising to a sharp,

conspicuous peak, while the N extremity is low and covered with grass. Several islets and rocks lie close off the island. A light is situated on the S extremity of Sohuksan Do. A light is shown from an elevation of 88m on the N end of Sohuksan Do.

A sunken rock, the position of which is approximate, was reported to lie about 10 miles N of the island.

Sojungwan Kundo (34°12'N., 125°30'E.), the SE group of Heugsan Jedo, lies about 20 miles NE of Sohuksan Do at the SW entrance of Maemul Sudo. This group consists of one large island and a number of islets and rocks. A light is situated on the N extremity of the large island.

Samt'ae Do (34°25'N., 125°17'E.), the middle group of Heugsan Jedo, lies about 20 miles NNE of Sohuksan Do. The group consists of three islands and several islets and rocks. The S and largest island of the group shows a light on the extremity of land extending from the N side. Sangt'ae Do, the central island of the group, is reported to be a good radar target at 14 miles. Pyon So, about 5 miles NNE of Sangt'ae Do, has a summit which appears pointed when seen from E or W, but rounded from N or S.

The tidal currents near Pyon So run N with the rising tide, with a maximum velocity of about 1 knot, and ESE with the falling tide, with a maximum velocity of 2 knots.

Hong Do (34°42'N., 125°12'E.), the NW group of Heugsan Jedo, lies about 35 miles N of Sohuksan Do. It is the outermost island among the islands lying SE of Korea. It is rugged and isolated; the surrounding waters are deep.

When seen from a distance NW, the island appears as two separate islands. A light is shown from an elevation of 88m on the N end of Hong Do.

3.3 Daeheugsan Gundo (Taehuksan Gundo) (34°42'N., 125°26'E.), the NE group of Heugsan Jedo, lies about 35 miles NNE of Sohuksan Do at the NW entrance of Maemul Sudo. The group consists of Taehuksan Do, the main island, and several smaller islands, islets, and rocks.

Yongsan Do, off the SE coast of Taehuksan Do, is difficult to identify from E as it does not show up plainly against Taehuksan Do. A light with racon is situated on the NW end of **Ka Do** (34°42'N., 125°27.8'E.). A light is situated on Hajuk To. A light is also situated in the N of Taehuksan Do.

Yori Am, about 4 miles NE of Daeheug Gundo, is the most dangerous rock in Heugsan Jedo. This rock barely covers and reefs extend about 0.2 mile from it. Caution is necessary in this vicinity because the tidal currents are strong, and it is not always marked by ripples.

Chinni Hang, on the N side of Taehuksan Do, affords the only good anchorage in Heugsan Jedo. The small harbor, which is protected by a breakwater, is sheltered from all except NE winds. A radio tower, painted in red and white bands, stands on a hill on the E side of the harbor, and about 0.2 mile NE of the village. Temporary anchorage, in 26 to 35m, can be taken off the N coast of Taehuksan Do and W of Chinni Hang. The tidal currents which run along the E and W sides of

Taeuksan Do meet here and are weaker. Care should be taken to avoid the axis of the current running through Kado Sudo, the passage between Taeuksan Do and Ka Do. The flood and ebb tidal currents in this passage flow NW and SE with velocities which may attain 3 or 4 knots or more.

Caution.—In general, the tidal currents in the vicinity of Heugsan Jedo set between N and NNW with the rising tide, and in the opposite direction with the falling tide. The maximum velocity in Maemul Sudo has been estimated at 2 knots, but this velocity increases in the narrow channels between the various islands of each group and off the promontories. Caution is therefore necessary when approaching these islands in foggy weather.

Maemul Sudo

3.4 Maemul Sudo (Single Channel), lying between Heugsan Jedo and the islands and islets off the SW end of Korea, is wide and deep with good passage to Incheon Kunsan, or to Mokpo through Jungdeung Hae on the W.

Traffic Separation Schemes have been established in Maemul Sudo. The schemes are not IMO adopted, but they are recommended by the Korean authorities. The general depths in the passage are over 36m throughout, except for the small bank with a depth of 19.2m, lying about 7 miles NW of **Chuk To** (Jug Do) (34°13'N., 125°51'E.), and a depth of 21.9m lying about 17 miles NNW of the same island. Two wrecks lie about 7 miles W of Chuk To. A light is situated on the summit of Chuk To. A fog signal is sounded and a radiobeacon transmits.

Kyomaek To (Maemul To)(34°31'N., 125°41'E.), in the fairway of Maemul Sudo, rises vertically on its N side.

Maenggol Kundo (34°13'N., 125°51'E.) lies on the E side of the S entrance of Maemul Sudo, about 18 miles E of Sojungwan Kundo. This group consists of three main islands which appear as one when seen from SE.

Pyongp'ung Do, about 5 miles SE of Maenggol Kundo, is very conspicuous.

Ui Do, the largest island of Ui Gundo, lies on the E side of the passage about 8 miles NE of Kyomaek To. The summit of the island, a sharp peak, is a good landmark.

A regular passenger ship is running between Ui Do (Jinri) and Mokpo.

Ch'ilbal To (34°47'N., 125°47'E.) lies on the E side of the N entrance of Maemul Sudo, about 10 miles N of Ui Do. A light is situated on Ch'ilbal To.

Tides—Currents.—On the E side of Kyomaek To, the N tidal current runs from about 1 hour before to 5 hours after the time of HW at Ch'ang Chiang; the S current runs for the remainder of the time. The maximum velocity is 3 knots.

About 1 mile E of Ch'ilbal To, the N current runs from about 30 minute before to 5 hours after the time of HW at Ch'ang Chiang; the S current runs for the remainder of the time. The maximum velocity of either current is about 4 knots.

Maenggol Sudo

3.5 Maenggol Sudo (34°14'N., 125°53'E.), lying between Maenggol Kundo and Koch'a Kundo, is a deep passage about 2 miles wide. Mongdok To on the SW side of the channel, is a

conspicuous islet as is Yanggan So, about 2 miles N of the N island of Koch'a Kundo.

Tides—Currents.—The tidal currents in Maenggol Sudo run NW from 2 hours after LW until about 2 hours after HW at Hajo Do, and SE from 2 hours after HW until about 2 hours after LW at the same island.

Approaches to Mokp'o Hang

3.6 Mokp'o Hang (34°47'N., 126°23'E.), on the SW side of the Korean peninsula can be approached by any one of several channels which lead through the numerous off-lying islands. While there are several passages suitable only for small craft and coasters with local knowledge, there are a few available for shipping. These latter passages, all of which meet at **Mogp'o Gu** (34°46'N., 126°18'E.), the principal entrance of Mokp'o Hang, will be the only ones described. From S these are Maro Hae and Changjuk Sudo, both of which lead into Chongdung Hae and Si Hae, from W directly into Chongdung Hae via Maemul Sudo, and from N through Myondo Sudo.

Maro Hae (34°23'N., 126°25'E.) lies between the coast N of Haenam Gak and the E side of Chin Do. At its N end this passage leads into Chongdung Hae via the narrow Myongyangdo. A least depth of 9.1m can be carried throughout, but it should not be entered without local knowledge because of the numerous dangers and the strong tidal currents. The S approach to Maro Hae is encumbered by several island groups, islets, and dangers. Chang Kundo, lying WSW of Haenam Gak, consists of five small islands and a few islets. A light is situated on the summit of Oryong Do. A fog signal is sounded from the light. Oryong Do is the largest island of the Chang Kundo group. Oemo Gundo, SW of Chang Gundo, consists of three small islands and several rocks. Am Do, the middle island of this group, is a good mark when seen from SE, having the appearance of a dog lying down with its head raised.

Other islands in the S approach include Milmae Do, Man So, Kalmyong Do, Kuja Do, and Soguja Do. A light is situated on Kuja Do.

Tides—Currents.—In Maro Hae the tidal currents run N and S near Samma Do with a maximum velocity of from 2 to 2.5 knots. In the SE entrance of Myongyangdo, HW and LW occur about 40 minutes later than at Samma Do, and in the NW entrance about 1 hour 30 minutes later.

In Myongyangdo, the tidal currents set NW with the flood and SE with the ebb. Off the light structure in the narrows the tidal currents attain a velocity of 7 knots at neap tides and 9 knots at spring tides, but close within the strait these velocities increase to 9 and 11 knots.

Aspect.—A useful mark for vessels proceeding N through the gulf is the conical hill on the W side of the second island N of Samma Do. A light is situated on the W side of this island. The rocky hill on the coast ENE is a good mark when entering Maro Hae from N. In the vicinity of Myongyangdo several hills are useful marks. **Kumgol San** (34°32'N., 126°18'E.), near the N end of Chin Do, is a sharp rocky peak and conspicuous from all sides. Mangum San, about 1 mile farther NNE, plainly indicates the position of the narrowest part of the strait.

An overhead cable, with a vertical clearance of 30m, spans Myongyangdo at its narrowest part. A bridge (34°34.1'N.,

126°18.4'E.), with a vertical clearance of 20m, also spans the channel.

Changjuk Sudo

3.7 Changjuk Sudo (34°19'N., 126°07'E.), the best approach to Mokp'o Hang from the S, lies between the SW side of Chin Do and the NE side of Tokko Kundo, Hajo Do, and Sangjo Do. The passage leads SW of a group of islands lying off the SW end of Chin Do, and then E of Songnam Do, at the NW entrance of the channel.

Tides—Currents.—In Changjuk Sudo, the tidal currents run NW from about 1 hour 20 minutes after LW at Hajo Do until about 1 hour 20 minutes after HW, and SE for the remainder of the time. The maximum velocity is 7 knots.

Chin Do, the largest island off the SW extremity of the Korean peninsula, is generally hilly. Sangoru San, the summit of the island, is difficult to identify except from N, but Yogwi San in the S part of the island is conspicuous from all sides. Somang-ni, at the SW extremity of the island, is a conical wooded hill useful as a landmark for vessels using the passage. A rocky peak, the S side of which is steep, stands near the coast about 1 mile E and appears as a horn when seen from E or W.

Bogsa Ch'o (34°06'N., 126°10'E.), about 10 miles S of the S entrance of Changjuk Sudo, has two rocky heads on which the sea breaks heavily.

On the SW side of Changjuk Sudo, Tokko Do, the largest and E island of the Tokko Kundo group, has a conspicuous and somewhat pointed summit. Pyon Do is also conspicuous.

Hajo Do has a fairly conspicuous sharp summit with a ridge running W and terminating in a conspicuous sharp, rocky crag. The rocky peak in the middle of the N side of the island is very conspicuous from N. A light is situated from the NE extremity and the NW side of Hajo Do. The summit of Sangjo Do is a sharp peak which is conspicuous from W.

Caution.—A wreck dangerous to navigation exists about 0.5 mile W of Chin Do.

Chongdung Hae

3.8 Chongdung Hae (34°27'N., 126°04'E.), the S and deepest approach to Mokp'o Hang, is the passage lying between the NW coast of Chin Do and the SE islands of Naju Kundo. Si Hae is the N continuation of this channel. Chongdung Hae is entered from S through Changjuk Sudo, and from W through Maemul Sudo.

Kasa Do, in the middle of the SW entrance of Chongdung Hae, lies about 3 miles NW of the W end of Chin Do. The summit of the island, in the N part, is a double peak and, along with the peak at the S end of the island, are conspicuous from W. From S only the N one is visible. Kunsodong Som (Taesodong Do), close off the S end of Kasa Do, is conspicuous. A light is situated on the S point of Kasa Do.

The pilot station off Kasa Do is approached from SE through Changjuk Sudo, and then E of Pul To, which lies about 1 mile SE of the S end of Kasa Do. A group of trees stands on the summit of Pul To. If approaching from W, vessels pass S of Puksong Do and Mosa Do, and then between Kasa Do and Pul To. Both of the former islets, lying about 3 miles SW of Kasa

Do, are covered with low trees, and Puksong Do has a pointed summit.

Chongdung Hae is about 10 miles in length and extends to a position off the N extremity of Chin Do where it joins Sia Hae. The recommended track passes on either side of Yangdok To and Panggu Do, and then on either side of Chakto Do. A light is situated on the NW point of Cho Do. Cho Do is located approximately 2 miles E of Panggu Do in position 34°30.5'N., 126°09.9'E. The track then leads about midway between Ku Do and Song Do. A light is situated on Ku Do. **Yangdeog Do** (34°30'N., 126°07'E.), with a peculiar-shaped rock on its summit, is thickly covered with pine trees and is a good landmark. Chuji Do, about 0.75 mile W of Yangdeog Do, has a large, conspicuous boulder on its summit and is the best mark in the vicinity. Chakto Do, in the middle of the main fairway, is cliffy with a flat summit.

Song Do, at the NE end of Chongdung Hae, is round-topped with a single pine tree on it.

Tides—Currents.—At the SW entrance of Chongdung Hae, SE of Kasa Do, the tidal currents run NE during the flood and SE during the ebb. The maximum velocity is about 4 knots. The flood runs from about 2 hours before to 4 hours after the time of HW at Ch'ang Chiang. At the NE end of Chongdung Hae, between Song Do and Ku Do, the tidal currents run NE with the flood, and SW with the ebb; it turns to SW about 4 hours after time of HW at Ch'ang Chiang and has a maximum velocity of about 3 knots, and to the NE about 1 hour before the time of HW and has a maximum velocity of about 4 knots.

3.9 Sia Hae (34°40'N., 126°14'E.), the N continuation of Chongdung Hae, lies between Hwaweon Pando and the SE islands of Naju Kundo. The bottom is very irregular throughout this passage, and there are several rocky islets on either side of the fairway.

Siha Do, on the E side of the fairway about 8 miles NNE of Ku Do, has a flat summit; a conspicuous clump of trees is E of the light. Vessels should steer a mid-channel course between Siha Do and the sunken rock about 1 mile WSW. Vessels should continue N, passing E of Pulmugi Do, and continuing far enough N so as to approach Mogp'o Gu on an ESE course. Pulmugi Do, a useful mark in clear weather, is a flat islet covered with grass.

Tides—Currents.—Near the middle of the channel through Sia Hae the tidal currents run N with the rising tide and S with the falling tide. The maximum velocity is 4 knots. The tidal currents turn to S about 4 hours the time of HW at Ch'ang Chiang, and to N about 1 hour before HW at Ch'ang Chiang. About 1 mile E of Pulmugi Do the direction of the tidal currents is the same as above, but the maximum velocity of the N current is 2 knots.

Myondo Sudo

3.10 Myondo Sudo (34°58'N., 126°06'E.), the N approach to Mokp'o Hang, lies between the N islands of Naju Kundo, and Hujung Do and Chonjung Do to the NE. This passage, which narrows to a navigable width of about mile, has a least depth of 7.3m. Vessels approaching from N generally use Chaewonso Sudo, which is about 1 mile wide and free from known dangers.

Bichi Do (35°13'N., 125°55'E.), the N group on the W side of the N approach to Myondo Sudo, are two clifly islets covered with grass. Heosa Gundo, two grass covered islets, lie about 4 miles S of Bichi Do. Bunam Dundo lies about 3 miles farther SSE; a conspicuous group of trees stand on the S and higher of the two peaks on Gal Do, the SE islet of this group.

Jaeweonseo Sudo (Chaewonso Sudo) (35°06'N., 126°00'E.) lies between Taenorok To and Chaewon Do. The channel is deep and clear, but there are some dangers to the N of Taenorok To. A light is situated on the SE side on Taenorok To. Depths in the fairway over the bank extending NNE from Taenorok To are from 7.3 to 9.1m.

The summit of Jaeweon Do is conspicuous, and the summit of Imja Do, separated from Jaeweon Do by Jaewondong Sudo, is also a good landmark.

Caution.—Depths of 0.9m and 3.7m were reported to lie approximately 1 and 2 miles SSW, respectively, of the southern extremity of Jaeweon Do, and charted depths in the area up to 2 miles SW of Imja Do were reported to be unreliable.

Myondo Sudo is about 2 miles wide at its entrance, NNE of Chaun Do, but it is narrowed by a large shoal. The summit of Chaun Do is a conspicuous rocky peak, as is the summit of Amt'ae Do, close SE. On the latter island, a rocky ridge runs SE from the conspicuous hill on the central promontory on the E side of the island to a prominent cliff.

Jaeweon Do, shaped like a helmet and covered with grass, lies in the middle of the channel about 1 mile N of Amt'ae Do. A light is situated on the NE point of Amt'ae Do. The fairway is W of this islet. After passing the NE extremity of Amt'ae Do, conspicuous landmarks include the conical summit of **Amhae Do** (34°51'N., 126°16'E.) and the sharp summit of Yok To, lying off its SW extremity.

Tides—Currents.—In Chaewonso Sudo and Chaewondong Sudo, the tidal currents run N with the rising tide and S with the falling tide, with a maximum velocity of 3 knots. The currents turn to S about 5 hours after, and to N about 1 hour before the time of HW at Ch'ang Chiang.

In Myondo Sudo, the tidal currents run N with the rising tide and S with the falling tide. The N current has been reported to attain a velocity of over 3 knots off the W end of Hujung Do.

Mokp'o (34°47'N., 126°23'E.)

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3.11 Mokp'o, principally a lighterage port, stands on the N side of the entrance of Yongsan Gang. Mokp'o Hang, S of the town, is a landlocked ice-free harbor entirely protected from wind and sea. It is bounded on the N by Muan Pando and on the S by Koha Do and Yongam Pando. The port is approached via Mokp'o Gu, lying between the N extremity of Hwawon Pando and the S extremity of Talli Do.

Winds—Weather.—At Mokp'o Hang the prevailing winds are N or NNW in winter, and S or SSW in summer. Gales are usually from directions between N and NW.

Fog will increase in frequency from April to June, and are most prevalent during the rainy season in July. In August the number decreases sharply.



Mokp'o

Tides—Currents.—In Mokp'o Gu the tidal currents are very rapid and subject to considerable diurnal inequality. According to observations made in the autumn during spring tides, it appears that the current in this passage turns as soon as it is HW in Mokp'o Hang and flows W with the falling tide. During the next hour the velocity increases rapidly to 6 knots, and two hours later it has reached its maximum velocity of 10 knots. One hour before LW the velocity is 6 knots and during the next half hour it falls to 2 or 3 knots. About the time of LW in the harbor the tidal currents in Mokp'o Gu turns, without any period of slack water.

The velocity of the E current is less than that of the W current. It attains its maximum velocity of about 4 knots about two hours after LW. The velocity then decreases slightly, but it is still as much as 3 knots 1 hour before HW after which it decreases rapidly to 1 knot. At night, the E current appears to have the same characteristics as the W current during the day and attains a velocity of 10 knots. In summer when the Yongsan Gang is in flood, the W current is reported to attain a velocity of 13 knots. Many vessels proceed through Mokp'o Gu with the E current, and all avoid meeting the full strength of the W current.

After flowing through Mokp'o Gu, a branch of the E current forms an eddy around the S of the shoals between Talli Do and Hosa Do; the major part of the current flows SE. About 3 hours after LW at Mokp'o, this eddy spreads out and the tidal currents along the E side of Talli Do and the W side of Hosa Do attain a velocity of about 1 knot. This current runs N past Koha Do and, after rounding Yong Do with a velocity of 2 to 3 knots, flows E into Mokp'o Hang. Another branch of the E current sets N through the narrow channel E of Koha Do, with a maximum velocity of 2 to 3 knots, and enters the S side of Mokp'o Hang.

The W current flows down the Yongsan Gang, and part of it sets S through the channel E of Koha Do. The main branch strikes Koha Do and is deflected NW along this coast with a maximum velocity of 3 to 4 knots. The greater part sets W and then S along the E side of Changja Do at a maximum velocity of 3 knots. This branch then forms an eddy around the shoals W of Koha Do, gradually spreading out to the S, with the main current flowing SW to the S end of Talli Do and then through Mokp'o Gu. As a result of the above currents, there is an almost constant current running SW along the E side of Talli Do, and a N current up the W side of Koha Do.

In the middle of Mokp'o Hang, it appears, from observations made in the autumn at spring tides, that the tidal currents turn about 50 minutes after HW and LW. The time of the turn, however, is influenced by the state of the Yongsan Gang, and at times it has occurred before high and LW.

To the SW of Samhak To, the tidal currents are irregular because of the water emptying out of the passage W of the island.

Depths—Limitations.—Mokp'o Gu, about 0.3 mile wide, has depths of about 29m and is free from dangers. Talli Pakchi, the deep passage E of Talli Do, has a minimum width of about 0.2 mile. Another deep channel, with about the same minimum width, is between Hosa Do and Koha Do on the E and extensive shoals on the W. A dangerous rock, with a depth of 1.3m and marked by a buoy, lies in the vicinity of Shihado Light.

Vessels of 8,000 tons can enter the harbor, but because of the tortuous and narrow access channel, combined with the strong tidal currents, it is difficult. Samhak To Pier, to the E of the harbor, is 168m long with a depth alongside of about 9m. Navy Pier can be used by vessels of 600 grt and 1,000 grt simultaneously.

Directions.—Mokp'o Gu should be approached on an ESE course in order to avoid the shoals lying W of the N end of Hwawon Pando. After passing through Mokp'o Gu vessels should turn sharply N.

Keep the extremities of Pak Pi and Ch'onch'uk Pi in line bearing 016°, until clear N of the shoals E of the SE end of Talli Do. Then a course should be steered along the E coast of changja Do until Nam Gak bears about 115° and is open NE of Yong Du. Course can then be altered E, passing N of the shoals W of Yong Du. After rounding Yong Du a mid-channel course may then be steered for the anchorage.

Caution.—During strong S and E winds there is an eddy in the opposite direction through Mokp'o Gu and off Yong Du, making it difficult to handle a vessel. It is also dangerous to approach the N end of Hwawon Pando before altering course to pass through Mokp'o Gu during spring tides at the middle of the ebb tide because the velocity of the tidal currents about 1 mile W of the entrance is about 9 knots. It is therefore better to steer for the middle of the entrance when about 1 mile off.

After passing through Mokp'o Gu about the middle of the flood current, vessels should not, when rounding the SE end of Talli Do, alter course too suddenly. For if the turn is made too sharply the vessel, because of the check in her speed and the eddy, may not answer her helm when put the other way, and her head may be gradually driven dangerously near the SE extremity of Talli Do. The vessel may also be carried toward this point by the reverse current setting SW along the E coast of the island.

An overhead cable, with a vertical clearance of 59m, span Mokp'o Gu in a NE and SW direction 0.5 mile SE of Hwawon Bando Light to Talli Do.

Overhead cables, with a vertical clearance of 12m, span the NE entrance between U Do and Changjwa Do and the S entrance between Talli Do and Oedal To with a vertical of 53m.

A dangerous wreck lies approximately 0.6 mile SSW of Oedal To.

During the flood tide inbound vessels will encounter the tidal current from NW when off the S end of Changia Do. Although the head may swing to starboard, it is advisable not to give her any helm to counteract this, as the current is only felt over a width of about 45m, and the vessel will naturally swing to port as the bow emerges from it.

During the ebb tide, no such precaution is necessary, but care is necessary in the vicinity of Yong Du. The harbor can be entered at night with attention to the tidal currents, but care is necessary to avoid the numerous unlighted junks usually found in or near the channel.

3.12 Talli Do (34°46'N., 126°19'E.), on the N side of Mokp'o Gu, is hilly and covered with pine trees; Sach'i San and Kumsong San are the highest points on the island. Oedal To, close W of Talli Do, is also hilly and covered with pine trees. Ch'onch'uk Pi, the NE extremity of Talli Do, is a conspicuous hillock, densely wooded and dark in appearance. Pak Pi is

about mile SSW of Ch'onch'uk Pi. Changja Do, about mile NE of Ch'onch'uk Pi, has a densely wooded summit.

Yong Du, the N extremity of Koha Do, is a conspicuous headland.

Yudal San (34°47'N., 126°22'E.), close W of Mokp'o, is a good mark for determining the position of the city from a distance. It consists of two peaks to the N and S. The S peak is somewhat higher. They are rugged cliffs of peculiar shape and easily seen. A shrine stands on a hill about 0.2 mile ESE, and a tower is about 183m farther E. The chimney, about 0.15 mile NE of Nam Gak, is conspicuous as are the two tall white chimneys of the power station about 0.5 mile E of the same point. There are four radio signal masts, the most prominent is 58m in height with red lights at the top, middle, and bottom.

Taea San, on the S side of the harbor about 2 miles SE of Yudal San, is a conspicuous bare peak. Some conspicuous oil tanks stand on the shore about 1 mile W of Taea San. Several oil tanks also stand near the S end of the reclaimed land at the W end of Samhak To.

Pilotage.—Pilotage is compulsory, the pilot station is off **Kasa Do** (34°27'N., 126°04'E.). Vessels should radio request for pilots at least 24 hours in advance. In rough weather pilots sometimes have considerable difficulty in boarding, and vessels have had to wait as much as two days before one could be embarked. Pilots are also available at **Pulmugido** (34°44'N., 126°14'E.).

Pilots recommend that vessels depart on the flood as it is easier to avoid fishing craft.

Radiotelephone service is available on VHF channels 12 and 16. A signal station is about 183m N of Nam Gak. Storm signals are displayed at Mokp'o.

Anchorage.—Vessels can anchor in the various sections of the harbor, which are best seen on the chart, as follows:

1. Section I—Vessels less than 30,000 gross tons, clear of the passage.
2. Section II—Vessels less than 30,000 gross tons.
3. Section III—Vessels carrying dangerous cargo.
4. Section IV—Vessels less than 30,000 gross tons, clear of the passage.
5. Section V—Vessels less than 200,000 gross tons.

The quarantine anchorage is situated at position 4°45'N, 126°20'E, in the outer harbor outside harbor limits.

Vessels are advised not to anchor in mid-stream, where the tidal currents combine with the full strength of the river current. Vessels are also advised not to anchor in the area NNE of Munha Som, because the tidal currents there are strong and irregular, although anchorage farther E is good.

Myeondo Sudo to Kunsan Hang

3.13 The coast between **Kaum Do** (35°13'N., 126°19'E.), close offshore E of the N entrance of Myeondo Sudo and Ch'ulp'o Hang, about 22 miles NNE, is mostly high. Its fringing bank is studded with rocks and islets, and depths of less than 11m are found as far as 7 to 9 miles offshore. The coast for a distance of about 25 miles farther NNE to Kunsan Hang is fronted by mud flats and shoals and should not be approached.

Anma Kundo (35°21'N., 126°00'E.), the SW group of the islands lying off this part of the coast, consists of seven islets,

the coasts of most of which are cliffy. A conspicuous clump of pine trees stands on the N side of the summit of Anma Do, the largest of these islets. Above-water dangers lie within 5 miles E and 4 miles NE of Anma Do; a dangerous wreck lies sunk about 6 miles W of Anma Do. A light is situated on the W end of **Hoeng Do** (35°20.1'N., 125°59.5'E.).

Wi Do (35°35'N., 126°17'E.), about 17 miles NE of Anma Kundo, is hilly and wooded. The summit of the island, in the NE part, is a conspicuous blunt peak. Sik To, consisting of two hills joined together by a low neck, lies close NW of the N end of Wi Do. Drying rocks lie within about 1 mile of the W side of Wi Do. An area fouled by the remains of a salvaged wreck lies about 5 miles W of the S end of Wi Do. A light is situated on the summit of Ch'aryun Do, close SW of Wi Do. A light is shown between Wi Do and Sik To.

Caution.—A military practice area, with a radius of 5 miles, is centered on Miyo-do, about 7 miles ESE of Wi Do.

3.14 Sangwangdung Do (35°39'N., 126°07'E.), with several smaller islets close E, lies about 8 miles NW of Wi Do. Hawangdung Do, close S, has two peaks, the W one of which is higher. An area fouled by the remains of a salvaged wreck lies about 5 miles NE of Sangwangdung Do. A light is situated from the summit of Sangwangdung Do.

Kogunsan Kundo (35°50'N., 126°25'E.), about 12 miles NNE of Wi Do, consists of several islands lying in two chains, and separated by a channel about 1 mile wide. All the islands have mostly bare and precipitous hills. Kwallido, the W island of the S chain, has a conspicuous wooded peak at its N end. Mal To is the W island of the N chain. A light is situated on the W extremity of Mal To. Hoenggyong Do, 0.2 mile E of **Pangch'uk Do** (35°51.0'N., 126°22.6'E.), has a light at the W end of the islet.

Huk To, about 7 miles W of Mal To, is bare with a pointed summit. Chik To, about 4 miles farther WNW, is a precipitous rocky islet with a sharp summit.

Caution.—A military practice area, with a radius of 11 miles, is centered on Chik To.

Fishing nets are laid for a distance of about a mile SE from a position the same distance SSE of the W end of Mal To. To the S of Huk To and Chik To, buoys with red flags are found.

Sibidongp'a Do (35°59'N., 126°13'E.), about 9 miles NW of Mal To, is a group of about a dozen islets lying on a horseshoe-shaped reef. A light is situated on the largest island in Sibidongp'a Do. A dangerous wreck lies sunk about 7 miles E of this group, and an area fouled by the remains of a salvaged wreck lies about 1 mile W of the dangerous wreck. Another dangerous wreck lies sunk about 3 miles N of the group.

Kunsan (35°59'N., 126°42'E.)

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3.15 Kunsan (Gunsan), of considerable importance as an outlet, stands on the S side of the entrance of Kum Gang; Kunsan Hang is the anchorage off the city of Kunsan. Janghang, on the N side of the river opposite Kunsan, is considered as a berth in the port of Kunsan. The harbor is approached via a



Kunsan

narrow channel between low-lying dangers which give a poor radar presentation.

Winds—Weather.—The prevailing winds are between NE and NW in winter, and between SE and SW in summer. The winds are generally light and gales are rare.

The handling of cargo is sometimes hindered or interrupted by NW winds, which are most frequent from September to February. There are about 30 days in a year when it is impossible to work cargo in the river mouth, and about 10 days when handling is prevented in the harbor.

Fog is most prevalent during June and July. It sometimes lasts for several days, but usually occurs around sunrise and is dissipated during the morning.

Tides—Currents.—In Kunsan Hang, the flood current slackens about 20 minutes after **Osik To** (Osig Do)(35°58'N., 126°34'E.), and ebbs about 30 minutes later. The flood current attains its maximum velocity of 3 knots midway between Chonmang San and Kunsan Hang, about 4 hours before the time of HW at Inchon. The ebb current is strongest off the S side of Yubu Do, where it attains a velocity of 4 knots about 2 hours after the time of HW at Inchon.

At the anchorage off the piers at Kunsan, the flood current runs for about 5 hours, with a maximum velocity of 2 knots; the ebb current runs for 6 hours, with a maximum velocity of 3 knots. The slack lasts for about 15 minutes. For several days after a freshet the ebb current may run at twice its usual velocity, and it runs for a longer period while the flood current runs for a correspondingly shorter period.

Off Osik To, slack water at the end of the rising tide occurs about 1 hour before the time of HW at Inchon, and at the end of the falling tide about 5 hours after HW.

Depths—Limitations.—The principal berths at Kunsan are several pontoons, each about 122m long with depths alongside of 7.6m. There is a T-head wharf, with a head 140m long, approximately 0.1 mile to the SW of Minya Am.

Vessels with a draft of 5.5 to 8.2m can enter the harbor depending on the height of the tide, the limiting factor being the bar at the river entrance. An underkeel clearance of 0.6m is required. The fairway over the bar is very narrow, and due regard for tide and wind set are of utmost importance. Vessels exceeding a draft of 4.6m should not attempt to enter if there is a heavy swell.

The maximum draft for vessels anchoring is about 9.1m. The maximum alongside depth is about 7.6m.

Aspect.—**Piung Do** (Bieung Do)(35°57'N., 126°32'E.), brown-colored and conspicuous, lies on the E side of the entrance of the approach channel. A light is situated on the W end of Piung Do. Osik To, about 1 mile NE of Piung Do, has a conspicuous clump of trees on the hill at the E end of the island; two groups of pine trees stand on the W side of the summit of the island. An overhead power cable, with a vertical clearance of 17m, is in position between Naecho Do and Piung Do. Towers with obstruction lights are at the ends and at the connecting point of the cable.

Ponghwa-Ryong, a sharp peak close SW of Kunsan, is the highest hill in the vicinity and is easily identified. Chonmang San stands on the N entrance of Kum Gang. A conspicuous stack, reported visible at a distance of 20 miles in clear weather, is on the summit of Chonmang San.

Pilotage.—Pilotage is compulsory. Pilots will board vessels in position 35°59'N., 126°27'E. Vessels should govern their arrival at the bar at or about HW slack. Request for pilots should be made at least 27 hours in advance.

It is advisable to notify the pilot before entering and departing the harbor due to the variable change in tidal levels and the strong current with the out flow.

Anchorage.—Deep-draft vessels are lightened in the stream S of Yubu Do before proceeding to Kunsan. Precautions must be taken in this outer anchorage in moderate N and S breezes, at change of the tide, and because of the narrowness of the anchorage. Lighters cannot stay alongside during a fresh W breeze and an ebb tide. In the harbor small vessels can anchor, in 6 to 9m.

Caution.—A great amount of silting occurs in the main channel. As a result, depths in the bar, the entrance channel, and in the harbor are continually changing and constant dredging is required.

3.16 Och'ong Do (36°07'N., 125°59'E.), about 28 miles WNW of the entrance of Kunsan Hang, is a high wooded island with either cliffy or rocky coasts. A sharp rock rises conspicuously about 0.3 mile off the SE extremity of the island. A dangerous wreck lies sunk about 8 miles WSW of the island. A light is situated on the NW end of Och'ong Do. A radiobeacon transmits.

Och'ongdo Myoji, the inlet on the S side of Och'ong Do, affords sheltered anchorage, in 11 to 15m, sand and mud, good holding ground in its middle part.

Oeyon Yolto, lying to the N and NNE of Och'ong Do, consists of six islands and several rocky islets and dangers. **Hwang Do** (36°14'N., 125°58'E.), the W island of the group, is barren and rocky. Pyon Do, about 1 mile NE, is a conspicuous pointed rock of light brown color and covered with grass; a shoal lies about 183m off its NE side. A barren, round topped islet lies about 1 mile ESE of Hwang Do.

Oeyondo Myoji (36°13'N., 126°03'E.), enclosed by Hoenggyon Do, O Do, Oeyon Do, and Taech'ong Do can be entered from NW, the preferred approach, or SE. The N part of this area has moderate depths and a sandy bottom, while the S part is deeper and the bottom is rocky.

Anchorage can be taken, in about 16.5m, with Hwang So, which lies about 1 mile N of O Do, bearing 152°. The approach

should be made with the conspicuous hill on the SW end of Oeyon Do bearing 114°.

3.17 Ch'onsu Man (36°25'N., 126°28'E.) is a narrow bay lying between the mainland and Anmyon Do. The depths within the bay are convenient for anchoring, but the numerous islets and reefs in the entrance make the fairway tortuous. The approach from S is also encumbered with numerous islets and shoals. Songju San, E of the entrance of the bay, is a sharp and conspicuous peak.

Pilotage.—Pilotage is compulsory and the boarding station is situated about 2.5 miles W of the entrance channel fairway buoys No. 1 and 2. The pilot boards during daylight hours only.

Directions.—The main approach to Ch'onsu Man is along a dredged channel, with a least depth of 14.1m, entered 8 miles NW of Yon Do.

The channel marked by lighted buoys leads ENE for 2 miles then gradually turns NNE to pass W of **Soyo Am** (36°19'N., 126°29'E.). Between the entrance and Lighted Buoy No. 10 (36°13.7'N., 126°25.2'E.) the channel is 0.2 mile wide, then widens to 1 mile abreast Soyo Am.

A depth of 14.5m in the center of the channel is marked by a (isolated danger) lighted buoy, 0.75 mile WNW of Soyo Am. A fish haven extends 3 miles S of Soyo Am.

Gojeong Hang (Kojong Hang) (36°24'N., 126°29'E.) at the mouth of Ch'onsu Man, is a private coal terminal feeding a power station. A T-headed pier lies in a N-S direction, where vessels up to 125,000 dwt with a maximum draft of 16.5m can berth at slack water.

3.18 Yon Do (36°05'N., 126°26'E.), the S island in the approach to Ch'onsu Man, is a useful landmark. A light is situated on the summit of the island. Its SE extremity is a cultivated plateau, and a small village stands at the inner end of a wooded promontory on the E side of the island. Anchorage can be taken, in 9 to 11m, mud, NE of the island.

The recommended approach to Ch'onsu Man leads NNE from a position about 2 miles W of Yon Do, and between this island and the dangerous wreck about 3 miles NW.

Yong Do, on the W side of the approach about 11 miles NNW of Yon Do, has some low trees on its summit. Several shoals lie within 2 miles SE of Yong Do, and between the islet and the SE extremity of Wonsan Do, about 6 miles NNE.

Tabo Do (Tasurigii Amu), on the E side of the fairway, about 4.5 miles ENE of Yong Do, is a small rock with two peaks of a reddish-gray color.

Soyo Am (Soniyo Amu), about 2.5 miles N of Tasurigii Amu, consists of three rocks which dry, and which are marked by ripples except during the period of slack water. The recommended track leads about 0.5 mile W of these rocks. A light is situated on Soyo Am.

Wonsan Do lies on the W side of the entrance of Ch'onsu Man close S of the S end of Anmyon Do. A pine forest on a hill on the E extremity of the island is a useful mark when approaching the bay. Anchorage can be taken, in 12.8m, sand and shells, about 1 mile E of Wonsan Do, with a group of conspicuous trees on Ponha San, about 1.8 miles E of Soru Somu, bearing 057°, and the summits of Mongdok To and Ch'u Do in line bearing 318°. This anchorage is sheltered from all except S winds, and the tidal currents are not strong.

The principal channel through the entrance of Ch'onsu Man leads NW between Hyoja Do and Mongdok To, and then N past the W sides of Samhyongje Do and Yuk To.

A quarantine anchorage is located mid-channel. It is centered in position 36°18'18"N, 126°27'25"E.

Gyeongryeolbi Yeoldo (Kyongnyolbi Yolto), (36°37'N., 125°34'E.), the outermost of a chain of islets extending nearly 30 miles W from the mainland consists of three islets about 1 mile apart. A light is situated on Pukkyongnyolbi Do, the middle island.

Sodung Do (Sodein) (36°38'N., 125°43'E.), E of Gyeongryeolbi Yeoldo, presents a conical appearance when seen from E or W, but shows two rounded hummocks of unequal height when seen from N. Sok To, about 0.5 mile NW of Sodung Do, has a rock close off its N end which resembles a junk when seen from E or W. Huk To, about 12 miles NE of Sodung Do, is easily identified because of its double summit. Kauji Do is the innermost of this chain of islets. A light is situated on **Ong Do** (36°38.8'N., 126°00.5'E.).

Caution.—A Traffic Separation Scheme (TSS), best seen on the chart, is located between Ong Do and Gungsi (Kungsi) Do, extending N to Heug Do and then NE to Gadae Am. A dangerous wreck lies in the separation zone close SW of Gadae Am.

Approach to Incheon

3.19 The approach to Incheon from S leads W and N of Gyeongryeolbi Yeoldo, and then NE to a position about 1 mile NW of **An Do** (36°57'N., 126°10'E.). From N or NW vessels should pass S of **Moktokto** (36°56'N., 125°47'E.), and then ENE passing N of An Do. Tong Sudo and Seo Sudo, the two channels of approach, unite about 10 miles SW of Incheon.

An Do, with a double summit, lies near the SW end of Changan T'oe. A light is situated on An Do. This bank, on which there are several islets and drying sand patches, forms the SE side of the approach to Tong Sudo. The mainland to the SE is very irregular and indented by several large inlets.

Moktokto, small and conical, lies about 21 miles NE of Gyeongryeolbi Yeoldo and about 18 miles W of An Do. A light is situated on Moktokto. A sunken wreck exists in position 36°50'50"N, 125°54'45"E, SE of Mogjeog To.

This islet, together with Kadok To and Toeryong Do to the N, form the SW end of Tokchok Kundo.

Ul Do (Wi Do) and Son'gap To lie on the NW side of the approach to Seo Sudo, about 11 miles and 16 miles NE of Moktokto. So-som, a drying rock, lies about 1 mile S of Son'gap To. A light is situated on the S summit of Ul Do.

Tong Sudo (Dong Sudo)(37°06'N., 126°20'E.) is the passage used by deep-draft vessels because, even though the dangers are more numerous, the tidal currents are not as strong as in So Sudo, never exceeding 4 knots. It can be navigated at night. However, caution is still necessary in the approach.

The entrance of Tong Sudo, from a position about 1 mile NW of An Do, should be approached on a NE course until on the 038° range, and then passing between Jangan Seo (Changan So) and the 8.5m shoal about 1 mile NW. In the vicinity of Jangan Seo, which dries 2.1m, vessels have reported strong sets and sudden fogs. A light is situated on Jangan Seo. A ramark is reported to transmit from the tower.

3.20 Taesan Hang (Daesan Hang) (37°01'N., 126°25'E.) consists of a steel jetty and concrete dolphins, with alongside depth of 11m, capable of handling vessels up to 200m in length and 35,000 dwt. The jetty is aligned 110°-290° and has three berths. A horn fog signal operates from the W dolphin. Taesan is a newly-developed industrial area.

Two tugs assist with the berthing operations and meet vessels in the vicinity of No. 13 Lighted Buoy. Berthing and unberthing is done only during daylight hours. The tidal current runs at a rate of 4 knots, and the tidal range at springs is 8m.

A T-head pier, marked by a light on each end of its head, is situated 6 miles S of the S extremity of Pung Do. The pier extends NNW into Tong Sudo, with alongside depths of 13 to 16m.

A second T-head pier, close NE of the oil berth, has charted depths of 11.9 to 15m alongside.

Anchorage.—Anchorage A-1, for vessels up to 100,000 dwt, lies NW of the pier. Anchorage A-2, for vessels up to 20,000 dwt, lies N of the pier.

Pung Do (P'ung Do)(37°06'N., 126°23'E.), with two peaks, lies about 4 miles ENE of Jangan Seo at the entrance of the approach to Asan Man.

3.21 Asan Man (36°59'N., 126°49'E.) lies at the head of the narrow gulf which extends about 20 miles SE from P'ung Do, on the E side of Dong Sudo in the approach to Incheon. The islets and shoals extending E and SE from P'ung Do divide the gulf into two channels, the N one of which is the one generally used. The S passage, although greater in depth, requires local knowledge.

Imye Som (Ipp'a Do) (37°06'N., 126°32'E.), about 7 miles E of P'ung Do, is a good mark for the channel. Haksan So lies about 1 mile NW of Imye Som. A shoal lies in mid-channel, with a depth of 7.6m, 1 mile NNE of Haksan So. Yuk To, the largest of the islets between P'ung Do and Imye Som, has a small group of trees on its summit; the tidal currents among these islets are very strong. A light is situated on Yuk To.

Songmun San, on the peninsula about 2 miles S of Imye Som, is a pointed peak. The summit of the peninsula, about 0.8 mile WNW, is wooded with pine trees.

Tangjin Hwaryok (37°03'N., 126°30'E.) is a berth 2.5 miles SW of Imye Som. The berth consists of a 400m long jetty with a 350m T-head, which has an alongside depth of 18.5m.

There is a 5 mile long channel, with a least charted depth of 17.7m, leading SE to the berth. Approaches to this channel begin about 1 mile NW of Mallyuk To. An anchorage has been established 0.6 mile NW of the berth and has a radius of 450m.

Tori Do (37°07'N., 126°37'E.), on the NE side of the channel, lies at the W end of a drying shoal about 3 miles E of Imye Som; the W side of this islet is precipitous. A light is situated on Tori Do.

Pang Do, about 8.3 miles SE of Tori Do, consists of a group of rocks, above water, surrounded by shoals. The narrowest part of the channel lies between the shoal around Pang Do and the SE extremity of Chungang Ch'ont'oe. A depth of not more than about 7.3m can be carried through this very narrow passage.

Asan Myoji, to the SE of Pang Do, lies between Nae Do and the narrow peninsula terminating in Nomi Gak, about 2 miles



Taesan Hang

ENE. Depths in the greater part vary between 12.8m and 18.3m, rock or sand bottom. The tidal currents are strong and sometimes attain a velocity of 3.5 knots. A shoal, with a depth of 4.5m, lies 0.75 mile SE of the highest rock of Pang Do.

Nae Do is marked by two orange range beacons and a red and white triangle about 183m WSW of the front range beacon. A conspicuous ancient fire beacon stands on the peak about 3 miles SW.

Tides—Currents.—About 2 miles N of a line between P'ung Do and Imye Som the tidal currents run E and W, turning at about the times of high and LW at Inchon. The maximum velocity is 4 knots. The tidal currents from 1 to 4 miles E of Imye Som run SE and NW.

At Asan Myoji, the tidal currents run ESE and WNW, turning at about the times of high and LW at Inchon. The maximum velocity is 3 knots. Within the harbor limits, the average tidal range is 6.4m at neaps to 8.6m at springs.

Depths—Limitations.—There is a deep water oil berth, 300m long, and marked by six yellow lights that extends WSW from a position 0.5 mile NW of Nomi Gak. It can handle vessels up to 100,000 dwt. An LNG pier has been constructed close NW of the oil berth and the area was being dredged to a depth of 14m. Several jetties with dolphins extend from Nomi Gak with average depths of 14m. The berths are marked by yellow lights and fog signals are sounded from several of the berths.

The Republic of Korea has a naval base, which consists of an E and W harbor, at the E end of the channel. The W harbor is for small patrol craft, while the E harbor can accommodate larger naval vessels with a maximum length of about 140m and drafts up to 8m. The naval harbor is protected by a breakwater with a light on the seaward end. The E harbor consists of a turning basin and six floating piers which accommodate the large tidal range; depths range from 12 to 14m inside the breakwater.

Pilotage.—Pilotage is compulsory and is provided by Inchon pilots. The pilot boards in position 36°57'N, 126°01'E, and is available during daylight hours only.

Anchorage.—An anchorage for vessels less than 110,000 gross tons is situated 1.5 miles W of the oil berth.

Directions.—Vessels proceeding to Asan Man by the N channel should pass about 1 mile N of P'ung Do, and steer an E course to a position about 1 mile N of Haksan So. Then alter



P'yongt'aek Hang

3.22 P'yongt'aek Hang (37°00'N., 126°44'E.), a developing port since 1986, with several land reclamation projects in progress, is situated approximately 30 miles SSE of Inchon.

Asan Man, with depths of 7.3 to 23m, extends about 8 miles WNW from **Nomi Gak** (37°00'N., 126°47'E.). Yong Am is a conspicuous pointed rock on the SW side of the channel in the vicinity of the naval base.

course to 118° to a position about 1 mile S of Tori Do, when course is altered again to 135° for the 0.9m rock at the SW end of Pang Do. Pass midway between the NW end of Pang Do and the SE end of Chungang Ch'ont'oe and fairly close SW of the above 0.9m rock on a course of 144°. A sector light can be observed along this leg of the channel. Course can then be shaped for the pipeline berth, taking care to avoid the shoals 0.5 mile SSE and 1 mile SE of Pang Do.

The summit of Sungbong Do, with some large pine trees, is a good landmark when passing W of Bu Do (Pu Do); vessels should pass about midway between Bu Do and the small islet lying off the SE end of Sungbong Do. There is a rock, which has less than 9m, E of the small islet. The bottom between Bu Do and Baeg Am (Paek Am), about 5 miles NNE, is foul, making it dangerous for anchorage in fog.

When approaching Baeg Am from S, its light structure does not show up well by day because of the dark background. Care is also necessary when passing E of Baeg Am, because of the 7.3m shoal about 0.5 mile E.

When abreast the N end of Yong-hung Do (Yeongheung Do), course should be altered to the NE when the light structure on **Pukchangja So** (37°20'N., 126°29'E.) is in line with the light on Palmi Do (P'almido).

Between Yeongheung Do and Pukchangja So, vessels are liable to be set E by the tidal current during the rising tide, and W during the falling tide; the effects of the falling tide is the stronger of the two.

Caution.—Numerous fishing havens lie near the entrance to the channel leading to P'yongt'aek Hang.

So Sudo (Seo Sudo)

3.23 So Sudo channel is designated as a channel for departing vessels of more than 500 tons from Incheon Hang (Incheon Hang). From about 0.5 mile S of Palmi Do (P'almido) at the junction of So Sudo and Tong Sudo, follow the outbound route of the traffic separation scheme in a general WSW, SW, and SSW direction to **Soya Do** (37°12'N., 126°11'E.) and to the end of the channel.

Tides—Currents.—The tidal currents in Tong Sudo and So Sudo run, in general, NE and SW, turning at about the times of high and LW at Incheon.

From observations made at spring tides, the currents in Tong Sudo attain a velocity of about 2 knots from 5 to 6 miles SW of Sanggongyong Do, 4 knots between Seungbong Do and Pung Do, and 3 knots off the W coast of Yeongheung Do.

Between Yeongheung Do and Daemueui Do (Taemuui Do), the tidal currents run E and W, turning at about the times of high and LW at Incheon, and attaining a velocity of 3 knots. In So Sudo, with observations at the same time, the currents attain a velocity of nearly 4 knots between Soya Do and Dongbaeg Do (Tongbaek To), and 2 knots about 2 miles NW of Jaweol Do (Chawol Do). In the narrow part of So Sudo, the currents may attain a velocity of 6 knots at times, but velocities of up to 8 knots have been reported.

Caution.—A dangerous submerged wreck lies off the NW side of Yeongheung Do, in approximate position 37°17'N., 126°26'E.

Inchon (37°28'N., 126°37'E.)

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3.24 Inchon (Incheon), on the E side of the entrance of Yom Ha, is port for the capital city of Seoul, about 15 miles inland. The port, which consists of an outer and inner harbor, is well sheltered and ice-free.



Inchon

Winds—Weather

The prevailing winds are from the NW. The prevailing winds for each month are as follows: NNW winds from January until March; WSW winds in April and May, prevailing gradually to the S; and frequent S to SW seasonal winds from June until August. In September and October, E winds prevailing to the N, alternate with W winds prevailing to the N. In November and December, the NW wind again becomes the prevailing wind.

Fog occurs with greatest frequency from April through August. The foggiest season is in June and July. Fog is mostly accompanied by rain. Around dawn outside Incheon, fog is particularly frequent, making the afternoon the best time for entering.

Tides—Currents

In the outer harbor, the flood current sets N toward the W end of Wolmi Do from about 30 minutes after LW to about 30 minutes after HW. The S current runs the rest of the time. Both currents have a maximum velocity of about 3 knots. For about 15 minutes at each turn the velocity is less than 0.25 knot.

In the inner harbor, the tidal currents are weak, not exceeding 1 knot.

Depths—Limitations

The inner harbor has been built upon reclaimed land between the mainland coast and the former islands of **Wolmi Do**

(37°28'N., 126°36'E.), on the N side of the lock gates, and Sowolmi Do, on the S side. Entrance to the inner harbor is by way of two parallel locks. The large lock has a total length of 381m and is 36m wide. It can take vessels up to a maximum 50,000 tons. The secondary lock, which is for vessels 10,000 tons or less, is about 288m long and 22.5m wide. There are eight piers, with a total of 48 berths; alongside depths are best seen on the chart.

Outer Harbor Oil and Gas Terminals.—Vessels normally berth starboard side-to. Due to the range of tide, attention to berth moorings is essential. Honam terminal consists of a barge moored 0.3 mile NNE of Seodu Am; a submarine pipeline is laid from the barge SSE to the shore. There are mooring buoys around the barge, to which a ship secures in a depth of 15.5m.

A causeway and pier extends 0.5 mile W from the corner of Yul To. At the head of the pier there is a dolphin berth, with a depth of 13.1m, known as the Kyungin terminal. Another pier and dolphin berth have been completed. These new facilities extend 0.2 mile W from the W end of Yul To.

A second harbor lies approximately 0.5 mile due S of the southern jetty head, of Inchon's outer harbor. It is enclosed by two breakwaters forming a tidal basin (the South Tidal Basin) with a width of approximately 160m between the two. The depths in the entrance are 4.4m, and fairly consistently remain at that depth throughout the harbor. There are a number of piers in the harbor, and two radio masts stand at the head of the bay.

There is a new coal terminal on the N side of the entrance to this harbor. It is 350m long and vessels up to 100,000 dwt can berth there.

A cement terminal lies about 0.4 mile S of the S tidal basin. Lights are shown from dolphins close to the NW and SE of the terminal. The channel to the S basin and the cement terminal leads through marked buoys.

The construction of a large tidal basin began in 1990 and lies at the N end of the port. The basin is entered close N of **Honam Oil Terminal** (37°29'N., 126°36'E.).

Aspect

Yeongjong Do lies on the W side of the entrance of Yom Ha and, together with the extensive mud flats that are extending from it, forms the W side of the outer harbor.

Baegun San (37°29'N., 126°31'E.), the summit of the island, is surmounted by a conspicuous clump of trees. Sinbul Do, about 0.4 mile SW of Yeongjong Do, has two summits of about equal height and a pale yellow color.

The Lock Control Tower is conspicuous. A white tower, 7.6m high, stands about 280m NW of the lock control tower. A similar tower is located about 210m WSW of the same lock control tower.

There are numerous conspicuous black and red banded chimneys, located about 3 miles SE of the lock control tower.

Jagyag Do (Chagyak To), E of Yeongjong Do, lies on the S part of a drying mud bank, and is easily identified because it is more densely wooded than others. A light is situated on Jagyag Do (Chagyak To).

The outer harbor consists of anchorages, some oil and gas terminals in the river, and two tidal basins, of which the S basin

is still being developed. The W side of the outer harbor is bounded by islands and mud flats which spread SW. They connect with a shallow bank extending NE from **Tokchok To** (Deogjeog Do) (37°14'N., 126°07.3'E.), thus forming the W boundary of the port approach.

From the SW, inbound and outbound routes, about 20 to 22 miles in length, lead through the island studded approach to the S limit of the harbor at **Palmi Do** (P'almido) (37°21'N., 126°31'E.).

This harbor is endowed with many natural advantages, but has the single drawback of a very large tidal range, which may reach 10m at maximum. At LW it is impossible for large vessels to berth, and they have to be anchored in the outer harbor for cargo-handling. In order to reduce this inconvenience, the inner harbor with lock facilities enables berthing of ocean vessels up to 50,000 tons.

The inner harbor is a nontidal basin which is entered through twin parallel locks. The two locks are situated between Wolmi do and Sowolmi do. The lock control tower, painted red and white in bands, stands between the locks.

At the NE end of the inner harbor there is a basin.

Pilotage

Pilotage is compulsory from Palmi Do to Inchon and is recommended from Changan So to Palmi Do.

Pilots board in the following positions:

- a. 37°20.6'N., 126°31.0'E.
- b. 37°03.1'N., 126°15.1'E.
- c. 37°03.5'N., 126°18.7'E.
- d. 37°13.8'N., 126°13.1'E.

Vessels approaching Inchon must radio to the port commander their position and estimated time of arrival 4 days and again 24 hours before arrival. If the estimated time of arrival changes more than 1 hour from the second report, it must be reported again 24 hours before arrival. Berths are assigned by radio.

Radiotelephone service is available on VHF channel 12; the calling channel is VHF channel 16.

Weather signals are displayed from a yellow framework tower on the N side of the entrance of the tidal basin.

During fog or port congestion, it has been reported (1996) that vessels are now informed to anchor off the outer pilot boarding position SW of Changan So Light. Vessels wait at the anchorage for the port to reopen or await the pilot to take the vessel to a designated anchorage for clearance.

Regulations

Designated Areas, best seen on the chart, have been established in the approaches to Inchon.

Vessels over 200m long, deep draft vessels, tug boats, and vessels carrying dangerous cargo are requested to inform the District Maritime and Port Authority of the vessel's name, gross tonnage, and scheduled time to enter the Designated Area at least 12 hours prior to entering the Designated Area.

A traffic separation scheme has been established by Korean authorities for approaching and departing Inchon. This scheme is clearly shown on the chart.

Signals

There are four signal stations in the vicinity of the locks. The following light signals are shown:

Signal	Meaning
At the control tower	
White letter I	Inbound vessels
White letter O	Outbound vessels
White letter X	Stop
At the signal stations	
GG	Enter
RR	Stop
GR	Wait
GG W	Enter left lock
GG W	Enter right lock
Both sides of the lock	
Lights at 10m intervals. The alignment of the locks is approximately 103°.	Berthing position

Anchorage

The anchorage is sheltered except from a strong S wind which raises a sea and makes cargo operations difficult. The holding ground S of Wolmi Do is good, but N of it the bottom is rocky and provides poor holding ground. Incoming vessels are anchored in one of the berths by the pilot. There is a quarantine anchorage about 5 miles SW of Sowolmi Do.

There are two inbound reserve anchorages located at position 37°04.4'N, 126°17.7'E, 4.5 miles W of Changan So, and position 37°19.7'N, 126°28.8'E, 3 miles WSW of Pukchangja So, respectively. An outbound reserve anchorage is located at 37°21.3'N, 126°30.8'E, 1.7 miles NW of Palmi Do.

3.25 Yonp'yong Yolto (37°40'N., 125°42'E.), about 44 miles WNW of Incheon, lies on the SE side of the approach to Haeju Man. The group consists of two islands and several islets and rocks. Soyonp'yong Do, the S island, has a very conspicuous summit. A light is situated on the SE point of the island. Taeyonp'yong Do, the larger of the two islands, has a level summit.

Yong'yong-ni, on the SE side of Taeyonp'yong Do, stands at the head of Yonp'yong-ni Hang, a shallow fishing harbor. Two radio towers, painted in red and white bands, stand near the shore at the village.

Tides—Currents.—About 3 miles S of Soyonp'yong Do, the tidal currents turn counter clockwise in 12 hours and attain their maximum velocity from 2.5 to 3.5 hours after HW at Incheon. Observations made during spring tides show that the

current runs S at LW at Incheon with a velocity of nearly 1.5 knots, E at 3 hours 30 minutes after LW with a velocity of 2 knots, NNW at HW with a velocity of nearly 1 knot, and W at 2 hours 30 minutes after HW with a velocity of nearly 2 knots.

Haeju Man

3.26 Haeju Man (37°45'N., 125°40'E.) is an extensive bay, encumbered by shoals, extending about 20 miles N from its entrance NW of Yonp'yong Yolto. Haeju Hang, at the head of the bay, is the port for Haeju about 3 miles farther N. The bay is entered by three channels which unite N of **Sosuap To** (37°50'N., 125°45'E.).

So Gu, the W passage, is entered between Hari Sho and Yuk To, about 0.75 mile NW. A light is situated on Hari Sho. The channel, from 0.5 to nearly 1 mile wide, leads NE between the partly drying banks extending from the W shore and the narrow shoal about 2.5 miles NE of Hari Sho. There are depths of about 14.6m in So Gu, except at its N end, about 1 mile N of Wa Am, where there are depths of from 5.8 to 7.6m. A light is situated off the NE end of Wa Am.

Chungang Sudo, the middle passage, leads NE between the above narrow shoal NE of Hari Sho and the shoal between Changjae Do and Sosuap To, and then between Sosuap To and Wa Am, about mile WNW. This channel has depths of more than 9.1m in the fairway at its N end, where the tidal currents may exceed a velocity of 3 knots at spring tides.

Tong Gu, the E passage, is entered between **Kal To** (37°43'N., 125°39'E.) and Sok To, about 1 mile ESE; the former islet has two peaks, the higher one of which is sharp and conspicuous. This channel, which leads E of Taesuap To, is suitable for small vessels only. The summit of Taesuap To appears as a whales back when seen from S, and has a small group of trees on it.

Tides—Currents.—In Haeju Man the flood tidal current sets toward the head of the bay, and the ebb sets in the opposite direction. The turn occurs at about high and LW. In the W entrance the maximum velocities are about 2 knots on the flood and 4 knots on the ebb. In the E entrance the velocity is about 2 knots. Within the bay, a velocity of about 2 knots is to be expected between Taesuap To and Hyongje Do, about 7 miles N.

3.27 Yongdangp'o (38°00'N., 125°42'E.) (**World Port Index No. 60310**), the port for Haeju, stands on the N side of Haeju Hang at the N end of Haeju Man. The harbor, reported to be entirely frozen over from January to March, is only about 0.25 mile wide.

A quay, 610m long with a depth of about 7m alongside, exists in the harbor.

Pilotage.—Pilotage is compulsory. The pilotage anchorage position is 37°41.0'N, 125°33.5'E. The vessel should anchor and wait; otherwise, the authority will not board the vessel.

The tidal currents in the harbor are reported to attain a maximum velocity of about 4 knots. The winds are variable making great caution necessary at night. Storm signals are displayed.

Fairly good anchorage can be obtained, in 7 to 9m, rocky bottom, S of Chong Do, at single anchor with plenty of chain out. Vessels must anchor in mid-channel, where the tidal currents are very strong, because the space is so restricted.

Regulations.—The Korean Navy has advised vessels to keep the following routes because of special circumstances that exist between North Korea and South Korea.

Vessels enroute between a South Korean port and a Chinese port should navigate near the trackline:

- a. 37°03'N, 125°40'E.
- b. 37°29'N, 124°43'E.
- c. 38°00'N, 124°18'E.

Vessels enroute between Haeju and a Chinese port should navigate near the trackline:

- a. 37°42'N, 125°34'E.
- b. 37°29'N, 125°23'E.
- c. 37°29'N, 124°43'E.
- d. 38°00'N, 124°18'E.

Vessels enroute between Haeju and a South Korean port should navigate near the trackline:

- a. 37°42'N, 125°34'E.
- b. 37°33'N, 125°32'E.
- c. 37°03'N, 125°40'E.

Vessels seeking shelter from heavy weather should keep to the S of Soch'ong Do, and avoid the areas around Paengnyong Do and Taech'ong Do.

Caution.—Navigation in Haeju Man is seasonal. Aids to navigation may be withdrawn or extinguished in winter.

3.28 Sunwido Myoji (37°45'N., 125°20'E.) lies between the E side of Sunwi Do and the W side of the peninsula which terminates S in Tungsan Got. The channel formed is the S part of Kangnyong Gang which continues another 13 miles NE. Ong Do, and the drying shoal about 1 mile S, lying about 5 miles SW of Tungsan Got, are the outermost dangers in the vicinity.

Kari Got, the SW extremity of Sunwi Do, is a precipitous headland with a conspicuous peak on it.

In the entrance of Sunwido Myoji scattered reefs and shoals, many of which dry, reduce the approach to two narrow channels, the W one is preferred. Depths in the passage E of the NE side of Sunwi Do vary from 12.8 to 27.4m. To the N of Sunwi Do the depths are from 12.8 to 18.3m over a width not less than mile. Good anchorage is available off Yonghodo-ri, at the SE end of **Yongwi Do** (37°47'N., 125°20'E.), in 11 to 14.6m, sand and mud.

Vessels entering Sunwido Myoji should exercise extreme caution due to the strong, irregular tidal currents and the banks which constantly shift their positions. The E approach can be made between Un So and Ong Am, but Apchon, lying in mid channel must be avoided. The W channel, the one generally used, lies between Sunwi Do and Yohyong Ch'lloe. From E, a vessel should pass S of Ong Do and the shoal S of it, or NE of Ong Do, steering for the SW extremity of Sunwi Do. When the hillock on P'ogi Got bears 062°, course should be altered to that heading. This course leads about 0.15 mile SE of Suya So. When Tungsan Got bears 132°, course should be altered to 034°, proceeding to the anchorage in mid-channel.

Taech'ong Kundo

3.29 Taech'ong Kundo, lying 8 to 13 miles off the Korean coast, consists of three islands and several islets, rocks and shoals. The group is frequented each year by fishing vessels.

Soch'ong Do (37°46'N., 124°45'E.), the S island of the group, is reported to afford the only shelter in the vicinity during the N gales of winter. The SE extremity of the islands consists of white cliffs.

A day signal station, the mast of which is conspicuous, is close WNW of the light structure on Soch'ong Do.

Soch'ong Ju, about 2 miles ESE of Soch'ong Do, is the outermost danger surrounding the island.

Taech'ong Do, about 2 miles NW of Soch'ong Do, appears conical when seen from W. The coasts are mostly cliffy, with the middle part of the S coast precipitous and the NE coast made up of a white sandy beach.

Anchorage can be obtained in the small bay with a shingle beach on the E side of the island, in 10.4 to 16.5m, sand, with the E extremity of Paengnyong Do in line with the NE end of Taech'ong Do.

Kapchug Am, about 1 mile W of the S end of Taech'ong Do, is high and precipitous.

Paengnyong Do (37°57'N., 124°40'E.), the largest of the Taech'ong Kundo, lies about 4 miles N of Taech'ong Do. The nearly flat summit of the island can be easily distinguished from SE. Yonggiwon San, the E extremity of the island, rises precipitously to an isolated hill. A light is situated on the E end of Paengnyong Do. Yon Bong consists of two conspicuous rocks lying close together between Paengnyong Do and Taech'ong Do; this vicinity is encumbered with shoals extending from each island.

The passage, between Taech'ong Kundo and the mainland E, leads between Soch'ong Ju and Paengnyong Ju on the W, and Kirin Ju and Chung Ju on the E. When a sea makes up, Chung Ju is marked by breakers and can be easily located, but under ordinary conditions it is not easily located because the water is uniformly discolored.

Tides—Currents.—In the vicinity of Taech'ong Kundo the tidal currents generally set N and S, with a maximum velocity of 3 to 4 knots. The turn of the currents occurs about 3 hours after high and LW at Inchon. It should be remembered that the tidal currents may be influenced by the direction and force of recent winds.

Approaches to Taedong Gang

3.30 Changsan Got (38°08'N., 124°39'E.), 32 miles SSW of the entrance of Taedong Gang, is the most prominent headland on the W coast of Korea. The peninsula rises to T'aesan Bong, about 5 miles E. A large rock lies close off Changsan Got. In the vicinity of this headland, the tidal currents set N with the rising tide and S with the falling tide; a velocity of 5 to 7 knots may be attained.

The coast NE, for a distance of about 16 miles to Oryuji Gi, consists of a bight with sandy beaches and backed by hilly ranges a few miles inland. Within Oryuji Gi, the land rises steeply to Kwangsok San, and then continues hilly for another 4 miles NE. Continuing to Naengjong Dong, about 9 miles farther N, the land is low.

Chang Ju, with depths of less than 3.7m, extends about 18 miles N from a position about 4 miles NNE of Changsan Got, and forms the W side of the approach to Ch'odo Sudo.

Ch'o Do (38°32'N., 124°50'E.), the large island lying on the SW side of the main entrance of Taedong Gang, serves as a

good landmark for the river mouth. A prohibited entry area, with a 2 mile radius, covers an underwater obstruction that lies 13 miles W of Ch'o Do.

An area dangerous to navigation, with a radius of 13 miles centered at 38°37.5'N, 124°04.9'E, lies about 32 miles W of Ch'o Do.

So Do (38°32.9'N., 124°45.9'E.) lying W of Ch'o Do, is an islet 89m high with a light is shown from its summit. Tok To, another islet, lies close W to the NW point of Ch'o Do.

Songmun Am (38°30.5'N., 124°54.5'E.), an islet close E of Ch'o Do from which a light is shown, marks the 4 mile stretch of Nae Ju shoal, with a least depth of 0.4m. Ch'odo Sudo lies between Ch'o Do and the mainland E.

Pansong Ch'o, a rock with a depth of 1.8m, lies 2 miles NE of Songmun Am Light.

Sok To (Soku To) (38°39'N., 125°00'E.), about 9 miles NE of Ch'o Do, lies off the S side of the entrance of Taedong Gang, and, together with Chamae Do (Shimai To) lying close NW, lie on the S side of the main entrance channel of the river.

People's Republic of Korean Regulations require foreign vessels to send their estimated arrival times at the pilot station five days, 24 hours, 12 hours, and 4 hours in advance; the arrival draft must be included in the ETA message. It was reported that foreign vessels are required to keep 15 miles off the Korean coast until near approach to the port-of-call in People's Republic of Korea; vessels are also to report the position and speed prior to and on crossing the latitude of 37°N.

Pilotage.—Pilotage is available and compulsory. Pilots board at No. 1 Pilot Station and Waiting Area No. 1 for foreign vessels, centered at position 38°41.0'N, 125°02.5'E during daylight hours only. Health and Custom officials board together with the pilot.

When the estuary is covered in pack-ice, during January and February, the pilots board inward at Waiting Area No. 2 for foreign vessels, centered at position 38°41.0'N, 125°02.5'E.

Regulations.—A TSS has been established in the approaches to Taedong Gang. This scheme is not IMO adopted and it is not known what regulations are in force; mariners are advised to assume that Rule 10 of the 72 COLREGS applies.

Taedong Gang

3.31 Taedong Gang (Daido Ko) flows in a general W direction into the Yellow Sea through a large estuary encumbered by islands, banks, and shoals. The river is more discolored than any other in Korea, and with the ebb current the dirty water is carried far out to sea.

The entrance channel leads N of **Chamae Do** (Shimai To) (38°41'N., 124°59'E.) and Sok (Soku) To, SW of **Chiri To** (38°42'N., 125°08'E.), and then through P'ido Sudo (Pito Sudo). A light is reported to be shown on Chamae Do.

Caution.—Vessels must pass through a lock in the Western Sea Barrage located S of Pido (38 41'N., 125 11'E.) to reach Nampo. Vessels with a maximum length of 210m, a maximum beam of 30m, and a maximum draft of 10.5m can transit the lock. Transits take place during daylight hours only.

Namp'o stands on the N side of the river about 20 miles within the entrance, and can be reached by large vessels. K'yomip'o, on the E side of the river about 17 miles above

Namp'o, can be reached by vessels of 5,000 tons; Posan on the W side of the river about 9 miles farther upriver, can be reached by vessels of 3,000 tons. P'yongyang (Pingyang) is about 37 miles above Nampo'o.

Namp'o (38°43'N., 125°24'E.)

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3.32 Namp'o (Chinnanpo), on the N bank of Taedong Gang, is the outlet for the industrial and mining region of P'yongyang. Namp'o Hang (Chinnanpo Hang), S of the city, is nearly 1 mile wide and has sufficient space to accommodate several large vessels at the same time.

Winds—Weather.—From December to May NW winds prevail, while during the remainder of the year W winds are common. Heavy fog is prevalent from June to August.

Ice.—From late December to the middle of March the Taedong Gang usually freezes over and is impassable above Namp'o. For about three weeks during this period Namp'o is liable to be cut off from the sea because of drift ice. At times the river mouth, particularly the channel in the vicinity of Chamae Do, may be blocked temporarily by dense packs of drift ice. These drift ice conditions between Chamae Do and P'i Do (Pi To), about 10 miles E, determine whether or not entry into the river is possible.

The color of the ice is important to notice. Green or white ice is easily broken and is not dangerous, but brown or gray ice, formed on the drying banks, is full of mud and sand, not easily broken, and dangerous.

Navigational warnings concerning drift ice and other conditions of the fairway are issued by the radio station on Chamae Do; the continually changing effects of the tidal currents and the wind must also be taken into account.

Tides—Currents.—In the entrance of Taedong Gang near Ch'o Do and Sok To, the tidal current runs N or NE with the rising tide from about 2 hours before to 4 hours after the time of HW at Inchon. With the falling tide the tidal current runs S or SW from about 4 hours after to 2 hours before the next HW at Inchon.

Off Ch'o Do, the maximum velocities are 2 knots with the N current, and 3 knots with the S currents. Off Sok To they are 2 and 3 knots, respectively.

In the river the tidal currents are, in general, regular in some features, but do vary considerably with the season, wind, and rainfall. Both the flood and ebb currents follow the course of the river in mid-channel; the flood current runs for a shorter period than the ebb current, and there is only a short period of slack water. The currents are also stronger in the lower reaches than in the upper reaches. It has been reported that the main incoming current runs down the middle of the channel, while the main outgoing current is on the S side of the channel.

In P'ido Sudo the E current has a maximum velocity of 3.5 knots and the W current 4.5 knots. The flood current turns about 4 hours after the time of HW at Inchon, and the ebb current turns about 2 hours before the time of HW, and runs for about 7 hours.

In mid channel, SW of the basin at Namp'o, the ebb current runs for 7 to 7 hours 30 minutes, the turn occurring shortly before HW and a 1.5 to 2 hours after LW. The flood current



Namp'o—Berth No. 3 to Berth No. 7

attains a maximum velocity of about 3.25 knots and the ebb about 4 knots. Off both banks of the river the ebb current begins to run 1 to 2 hours earlier than in the middle of the river. Near the basin the tidal currents are very complex because of the irregular contour of the banks W of the basin.

Depths—Limitations.—In the W approach to Taedong Gang the depths are deep and clear of dangers; in the passage between Tok Som (Toku Somu) and Chamae Do the depths decrease to about 13m. This latter track leads close N of the NE end of a shoal extending about 5 miles NE from Tok Som.

P'ido Sudo, the narrowest part of the passage, is about 0.3 mile wide between the shoals on either side, but is deep in the fairway.

East of P'ido Sudo, the relatively wide channel leading to Namp'o is free from dangers in its middle part. Depths of 9.8m and over are found in the fairway of this channel.

Ch'odo Sudo, with depths of 11 to 29m in its approach from S, has a least width of about 1 mile in the fairway between Pansong Ch'o (Banjo Sho), about 2.8 miles NE of Huibong Gap, the SE extremity of Ch'o Do, and the shoal W. The track passes close W of the 9.4m patch about 3 miles N of Pansong Ch'o.

The Port of Namp'o basin has facilities to handle vessels of 3,000 tons, with a dredged depth of 6m. The E side of the basin has a depth of 3m and the head of the basin has a depth of 1.5m, and used only by small craft.

During the ebb current, there is a strong eddy along the E wall of the basin and vessels are liable to be swung round by it. It is difficult to go alongside or leave this wall between 1 and 2 hours after HW and LW.

Vessels with too deep a draft for an alongside berth in the basin can lighten ship, or complete loading, by the use of lighters at the anchorage. There are seven berths, located ENE of the basin, as follows:

1. Berth No. 3 has a length of 220m and a depth of about 11m.
2. Berth No. 4 and Berth 5, inside a basin N of Berth No. 3, are used by barges and small craft.
3. Berth No. 6, equipped for handling bulk cargo, is about 150m long, with a depth of about 11.5m.
4. Berth No. 7 and Berth No. 8 are each about 340m long. Berth No. 7, the W part, has a minimum depth of 6m. Berth No. 8, the E part, has a minimum depth of 11m and has special facilities for loading cement.
5. Berth No. 9, with a length of about 180m and a depth of about 12m, is used for loading coal.

Mariners are advised that due to salinity variations the drafts shown alongside are subject to changes.

Aspect.—Excellent marks in the approach to the river include Ch'o Do, Sok To (Soku To), and **Tok To** (38°45'N., 124°58'E.). **Manryokiki** (38°43'N., 125°23'E.), close within the W limit of the harbor, has a flagstaff on it. A conspicuous white building stands on the shore about 0.5 mile E of Man-

ryokiki, and about 0.5 mile farther NE are two conspicuous radio masts. Three chimneys, one very high, stand near the shore about 1 mile NE of the basin, and are particularly conspicuous. **Mangdalli Gi** (Botatsuri Saki) (38°43'N., 125°26.4'E.), the most prominent headland on the S shore, has a flattish summit and is easily identified.

Pilotage.—Pilotage is compulsory. Pilots board in a position about 3 miles NNW of **So Do** (Sei To) (38°33'N., 124°46'E.), but in rough weather, or at night, they board in the vicinity of Chamae Do, 13 miles NE. It has been reported (1994) that vessels enter or leave during daylight hours only.

Korean regulations require foreign vessels to send their estimated arrival times 5 days, 24 hours, 12 hours, and 4 hours in advance.

Anchorage.—Vessels can anchor, in 12.8 to 27.4m, mud or sand, outside the basin, at a distance of not less than 0.2 mile offshore. The holding ground, mud or sand over hard rock bottom, is not good, and caution should be exercised at the turn of the strong tidal currents. It is better to anchor in mid-river in about 18.3m, where the holding ground is better and the tidal currents are not so strong.

Taedong Gang (Continued)

3.33 The upper reaches of the Taedong Gang has not been reported on for quite some time, and information on this part of the river should therefore be used with caution.

Between Chinnanpo and **Aeam Gap** (38°39'N., 125°36'E.), the SW extremity of the peninsula formed by Taedong Gang where it changes its course to N, depths of 9.8m and over were reported. The tidal currents are very strong through this narrow part of the river.

Anchorage can be taken, although not recommended, in 15 to 17m, close off the SW bank of the river and W of **Ch'ol To** (38°39'N., 125°39'E.). The holding ground is good, but the tidal currents are strong and rotary.

Kyomip'o (38°44'N., 125°37'E.) ([World Port Index No. 60290](#)), on the E bank of the river, is the site of a large iron and steel works. The anchorage off the town can accommodate vessels of moderate size, in about 9.4m and greater. To the SW of the town, the rocky bottom affords poor holding ground, but farther downstream better holding of deep silt over rock was reported.

Posan (38°53'N., 125°34'E.) ([World Port Index No. 60300](#)), about 9 miles above Kyomip'o, is an anchorage off some coaling piers. Depths are from 8 to 9m, with good holding ground. Above this anchorage the river is reported to be unnavigable.

Taedong Gang to the Yalu River

3.34 Between the entrance of the Taedong Gang and Ch'olsan Pando, about 60 miles NNW, the coast forms a very extensive bay, which is encumbered with numerous shoals and drying banks. These narrow shoals lie more or less parallel to the E shore of the bay.

Nap-Som (39°16'N., 124°43'E.), with Chagunnap Som (Sorap To) close E and Mugi Do (Mungi Do) about 1 mile NNE, lie near the outer edge of these shoals. At night or in

foggy weather the cries of the numerous sea birds that frequent these islets may indicate their positions.

Ch'olsan Pando (39°40'N., 124°40'E.), on the E side of the approach to the entrance of the Yalu River, is rugged and hilly. The coastal area between the S extremity of Ch'olsan Pando and the Yalu River is fronted by broad tidal flats, beyond which are sand bars lying several miles offshore. Pae San (Chu San), about 2 miles N of the S end of the peninsula, has three peaks. Orang San, about 6 miles farther N, is also conspicuous, as is Yondae San, a sharp, isolated peak which rises steeply about 4 miles farther NW.

Taehwa Do, about 8 miles S of Ch'olsan Pando, is the southernmost of the group of islands extending S from the peninsula.

The Yalu River

3.35 The **Yalu River** (39°40'N., 124°15'E.), narrow and shallow, is the boundary between North Korea and China. This river and estuary are encumbered with drying sand and mud banks intersected by constantly changing channels. Only small vessels of limited draft and with local knowledge can reach the cities of An-tung and Sinuiju, about 15 miles upriver. Tong Sudo, the E passage, and So Sudo, the W passage, are the only practicable approaches to the river mouth. The former leads into Tasado Hang, the outer of the two ports at the entrance of the river, and the latter into Yongamp'o Hang.

Ice.—The river is practically closed to navigation from the end of October until the end of April or beginning of May.

Tides—Currents.—In Tong Sudo, the tidal currents run in the direction of the channel. The N current runs for about 5 hours, from 1 to 2 hours after LW until the time of HW. The S current runs for about 7 hours 30 minutes, from the time of HW until 1 or 2 hours after LW.

At Suun Do, the N and S current attain velocities of 2.25 and 2.75 knots, respectively; at Taedasa Do the currents attain velocities of 3.25 and 4.25 knots.

In So Sudo, the tidal currents set NE on the rising tide and SW on the falling tide. The times of change in direction are about the same as those in Tong Sudo, attaining maximum velocities of nearly 4 knots. Within the mouth of the river, the tidal currents are strong. They attain velocities of about 3 knots, but when the river is in flood the ebb current may attain a velocity of 5 knots.

Pilotage.—Vessels should notify the Pilots' Association at Sinuiju at least 24 hours prior to arrival off the estuary. Pilots board vessels off the entrance of So Sudo; pilots for Tong Sudo are usually picked up off the entrance of So Sudo. The limiting drafts of vessels are determined by the pilots.

Caution.—Vessels approaching the estuary should take soundings continuously, and should not attempt to enter the channels without a pilot. Extreme caution is also advised because the buoys and beacons that mark the shifting channels are moved without notice. During the ice season, the buoys are removed and the lights are extinguished.

Tong Sudo

3.36 Tong Sudo, which leads into Tasado Hang, was reported to have a depth of 6.1m in the fairway to the terminal at

Kwakkot Ch'oe. **Suun Do** (39°41'N., 124°25'E.), on the E side of Tong Sudo, is the westernmost of the Pansong Yolto. It has a rounded top, and is connected to the next islet E by drying rocks. A light is situated on the summit of Suun Do. Won Do, the easternmost and largest of the group, has a somewhat pointed summit. The entire group lies on the extensive bank forming the E side of Tong Sudo.

Un Do, on the W side of Tong Sudo, about 2.5 miles N of Suun Do, is a useful mark for the channel. A light is situated on Un Do. Pyok Do, about 1.25 miles NW of Un Do, is a reddish, rocky islet. Se Do, about 3.5 miles farther NNW, appears pyramidal when seen from S.

Kach'a Do, on the E side of the fairway, about 3.5 miles NNE of Un Do, is nearly flat on top and bare. A beacon stands on the islet.

Tae-dasa Do (Tasa Do), about 1.8 miles NW of Kach'a Do, has two peaks, the N being slightly higher. Beacons mark the outer edge of the fringing reef.

Kwakkot Ch'oe (39°49'N., 124°25'E.) is a rocky headland, the E side of which is precipitous, and a village is on the W side. A seawall extends SW to Sodasa Do, while harbor works extend about 1 mile farther S. This artificial port lies between Sodasa Do and Tasa Do, and provides about 745m of berthing space with depths of 7.9 to 9.1m alongside. Another 610m of berthing space has depths of 3.7 to 4.9m alongside. The terminal is connected to the cities upriver by railroad.

Vessels, with a draft of about 4.8m, can anchor, in 5.8 to 10.1m, about 0.5 mile W of the N end of Tasa Do. Other vessels can anchor about 3 miles S of Tasa Do.

So Sudo

3.37 So Sudo, which leads into Yongamp'o Hang, is generally used by small vessels proceeding upriver. The passage is subject to great change, making local knowledge essential. The channel entrance is about 5 miles S of **Ku-lung Shan** (39°49'N., 124°01'E.), an isolated hillock on the low coast and which appears as an islet from the offing.

Two conspicuous red brick buildings stand at the SW end of the town about 6 miles NE of Ku-lung Shan. The channel runs between the coastline and the shoals and banks W and N of Sindo Yolto.

Maan Do (39°48'N., 124°11'E.) is the largest of the islets on the W side of Sindo Yolto. A light is situated on the SW peak of Maan Do. The light is not lit when the river is closed by ice. Sin Do, the largest islet of the group, rises to sharp peaks at its N and S ends. A large area of the bank N of Maan Do and Sin Do is covered with grass and only covers at HW spring tides.

Yongamp'o (39°56'N., 124°22'E.) stands on the E bank of the Yalu River just within its entrance. Small vessels with a draft not exceeding 4.1m can obtain indifferent anchorage off the town. Currents in the river are strong here.

An-tung and Sinuiju, about 11 miles farther upriver, are connected by a railroad bridge, with a clearance of 10.1m.